WHAT IS CLAIMED IS:

1. A machine-implemented method of processing a sequence of image frames, comprising:

computing respective sets of motion vectors for pairs of image frames;

classifying the computed motion vectors into motion classes;

identifying motion clusters in the image frames based at least in part on the motion classes; and

selecting an identified motion cluster as a motion stabilization reference based on spatiotemporal consistency of the selected motion cluster across multiple image frames.

2. The method of claim 1, wherein computing motion vectors comprises generating for pairs of image frames respective dense motion models describing motion at pixel locations with respective sets of parameter values in a motion parameter space.

3. The method of claim 2, wherein identifying motion clusters comprises iteratively clustering motion vectors from a coarse image frame resolution level to a fine image frame resolution level.

4. The method of claim 3, wherein at each image frame resolution level motion vectors are classified into motion clusters, and spatiotemporal consistency is determined for each cluster in a given image frame based on a projection of the motion cluster into a neighboring image frame using computed inter-frame motion

5. The method of claim 4, wherein the spatiotemporal consistency is determined based on degree of overlap between a motion cluster projected from the given image frame and a corresponding motion cluster in a neighboring image frame.

6. The method of claim 4, wherein motion vectors are re-classified with a modified clustering parameter in response to a determination that a computed spatiotemporal consistency measure is below a consistency threshold.

7. The method of claim 3, wherein motion vectors are clustered iteratively in accordance with a clustering method.

8. The method of claim 1, wherein selecting a motion cluster as a motion stabilization reference comprises projecting each motion cluster from image frames to respective neighboring image frames, and computing respective measures of spatiotemporal consistency for the projected motion clusters.

9. The method of claim 1, wherein the motion cluster selected as a motion stabilization reference for a given reference image frame has a greater spatiotemporal consistency measure than other motion clusters across multiple image frames neighboring the given reference image frame.

10. The method of claim 1, further comprising stabilizing the sequence of image frames with respect to a motion model computed for the motion cluster selected as the motion stabilization reference.

11. A system for processing a sequence of image frames, comprising:

a motion estimation module configured to compute respective sets of motion vectors for pairs of image frames;

a motion classification module configured to classify the computed motion vectors into motion classes;

a motion-based spatial clustering module configured to identify motion clusters in the image frames based at least in part on the motion classes; and

a motion stabilization reference selection module configured to select an identified motion cluster as a motion stabilization reference based on spatiotemporal consistency of the selected motion cluster across multiple image frames.

12. The system of claim 11, wherein the motion estimation module is configured to compute motion vectors by generating for pairs of image frames respective dense motion models describing motion at pixel locations with respective sets of parameter values in a motion parameter space.

13. The system of claim 12, wherein the motion-based spatial clustering module is configured to identify motion clusters by iteratively clustering motion vectors from a coarse image frame resolution level to a fine image frame resolution level.

14. The system of claim 13, wherein at each image frame resolution level motion vectors are classified by the motion classification module into motion clusters, and spatiotemporal consistency is determined for each cluster in a given image frame based on a projection of the motion cluster into a neighboring image frame using computed inter-frame motion

15. The system of claim 14, wherein the spatiotemporal consistency is determined based on degree of overlap between a motion cluster projected from the given image frame and a corresponding motion cluster in a neighboring image frame.

16. The system of claim 14, wherein the motion classification module re-classifies the motion vectors with a modified clustering parameter in response to a determination that a computed spatiotemporal consistency measure is below a consistency threshold.

17. The system of claim 13, wherein the motion classification module clusters motion vectors iteratively in accordance with a clustering method.

18. The system of claim 11, wherein the motion stabilization reference selection module selects a motion cluster as a motion stabilization reference by projecting each motion cluster from image frames to respective neighboring image frames and computing respective measures of spatiotemporal consistency for the projected motion clusters.

19. The system of claim 11, wherein the motion stabilization reference selection module selects as a motion stabilization reference for a given reference image frame the motion cluster having a greater spatiotemporal consistency measure than other motion clusters across multiple image frames neighboring the given reference image frame.

20. The system of claim 11, further comprising a motion stabilization module configured to stabilize the sequence of image frames with respect to a motion model computed for the motion cluster selected as the motion stabilization reference.

21. A machine-readable medium storing machine-readable instructions for causing a machine to:

compute respective sets of motion vectors for pairs of image frames;

classify the computed motion vectors into motion classes;

identifying motion clusters in the image frames based at least in part on the motion classes; and

select an identified motion cluster as a motion stabilization reference based on spatiotemporal consistency of the selected motion cluster across multiple image frames.

22. The machine-readable medium of claim 21, wherein the machine-readable instructions cause the machine to compute motion vectors by generating for pairs of image frames respective dense motion models describing motion at pixel locations with respective sets of parameter values in a motion parameter space.

23. The machine-readable medium of claim 22, wherein the machine-readable instructions cause the machine to identify motion clusters by iteratively clustering motion vectors from a coarse image frame resolution level to a fine image frame resolution level.

24. The machine-readable medium of claim 23, wherein at each image frame resolution level motion vectors are classified into motion clusters, and spatiotemporal consistency is determined for each cluster in a given image frame based on a projection of the motion cluster into a neighboring image frame using computed inter-frame motion

25. The machine-readable medium of claim 24, wherein the spatiotemporal consistency is determined based on degree of overlap between a

motion cluster projected from the given image frame and a corresponding motion cluster in a neighboring image frame.

26. The machine-readable medium of claim 24, wherein the machine-readable instructions cause the machine to re-classify the motion vectors with a modified clustering parameter in response to a determination that a computed spatiotemporal consistency measure is below a consistency threshold.

27. The machine-readable medium of claim 23, wherein the machine-readable instructions cause the machine to cluster motion vectors iteratively in accordance with a clustering method.

28. The machine-readable medium of claim 21, wherein the machine-readable instructions cause the machine to select a motion cluster as a motion stabilization reference by projecting each motion cluster from image frames to respective neighboring image frames and computing respective measures of spatiotemporal consistency for the projected motion clusters.

29. The machine-readable medium of claim 21, wherein the machine-readable instructions cause the machine to select as a motion stabilization reference for a given reference image frame the motion cluster having a greater spatiotemporal consistency measure than other motion clusters across multiple image frames neighboring the given reference image frame.

30. The machine-readable medium of claim 21, wherein the machine-readable instructions cause the machine to stabilize the sequence of image frames with respect to a motion model computed for the motion cluster selected as the motion stabilization reference.